



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 8

999 18TH STREET - SUITE 200

DENVER, CO 80202-2466

Phone 800-227-8917

<http://www.epa.gov/region08>

JAN 11 2006

Ref: 8P-W-GW

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Steve Wall, District Manager
Petroglyph Energy, Inc.
4116 West 3000 So. Ioka Lane
Roosevelt, UT 84066

86 Modification - minor mod Approval

RE: ~~Additional Well to Antelope Creek Area Permit~~
UIC Area Permit No. UT20736-00000
Well ID: UT20736-04540
Ute Tribal 20-14, Duchesne County, Utah

Dear Mr. Wall:

The Petroglyph Operating Company, Inc. (Petroglyph) request to convert the former Green River Formation oil well, the Ute Tribal 20-14, to an enhanced recovery injection well in the Antelope Creek Waterflood project is hereby authorized by the Environmental Protection Agency (EPA) under the terms and conditions of the Authorization For Additional Well.

The addition of the proposed injection well, within the exterior boundary of the Uintah & Ouray Indian Reservation, is being made under the authority of 40 CFR §144.33 (c) and terms of the Antelope Creek Waterflood UIC Area Permit No. UT20736-00000. Unless specifically mentioned in the enclosed Authorization For Additional Well, the Ute Tribal 20-14 is subject to all terms and conditions of the UIC Area Permit UT20736-00000 as modified.

Please be aware that Petroglyph does not have authorization to begin injection operations into the well until all Prior to Commencing Injection requirements have been submitted and evaluated by the EPA, and Petroglyph has received written authorization from the Director to begin injection.

Prior to receiving authorization to inject, the EPA requires that Petroglyph submit for review and approval the following: (1) the results of a **Part I (Internal) mechanical integrity**



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*Scan under
UT 30736 - 00000
66 modification - minor
Mod Approved 1/13/2006
Will need to deal with
well Permit UT30736 -
04540 in new database
also.*

66 modification - minor mod approved

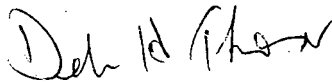


test (MIT), (2) a **pore pressure** calculation of the injection interval, and (3) a completed **EPA Form No. 7520-12** Well Rework Record.

The initial Maximum Allowable Injection Pressure (MAIP) for the Ute Tribal 20-14 was determined to be **1545 psig**. UIC Area Permit UT20736-00000 also provides the opportunity for the permittee to request a change in the MAIP based upon results of a step rate test that demonstrates that the formation breakdown pressure will not be exceeded.

If you have any questions, please call Mr. Dan Jackson at (303) 312-6155 or 1.800.227.8917 (Ext. 6155). Please submit the required data to **ATTENTION: DAN JACKSON**, at the letterhead address, citing **MAIL CODE: 8P-W-GW** very prominently.

Sincerely,



for Stephen S. Tuber
Assistant Regional Administrator
Office of Partnerships and Regulatory Assistance

encl: Authorization For Conversion of An Additional Well
EPA Form No. 7520-12 (Well Rework Record)

cc: without enclosures

Maxine Natchees, Acting Chairperson
Uintah & Ouray Business Committee
Ute Indian Tribe
P.O. Box 190
Fort Duchesne, UT 84026

Chester Mills, Superintendent
BIA - Uintah & Ouray Indian Agency
P.O. Box 130
Fort Duchesne, UT 84026

cc: with enclosures

Mr. Kenneth Smith
Executive Vice President and Chief Operating Officer
Petroglyph Energy, Inc.
555 S. Cole Blvd
Boise, ID 83709

S. Elaine Willie
Environmental Coordinator
Ute Indian Tribe
P.O. Box 460
Fort Duchesne, UT 84026

Gil Hunt
Technical Services Manager
Utah Division of Oil, Gas, and Mining
1594 West North Temple - Suite 1220
Salt Lake City, UT 84114-5801

BLM - Vernal District
170 South 500 East
Vernal, UT 84078



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AUTHORIZATION FOR ADDITIONAL WELL

UIC Area Permit No: UT20736-00000

The Antelope Creek Waterflood Final UIC Area Permit No. UT20736-00000, effective July 12, 1994, authorizes injection for the purpose of enhanced oil recovery into multiple lenticular sand units which are distributed throughout the lower portion of the Green River Formation. On August 1, 2000, the permittee provided notice to the Director concerning the following additional enhanced recovery injection well:

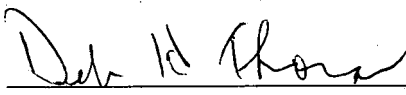
Well Name:	<u>Ute Tribal 20-14</u>
EPA Well ID Number:	<u>UT20736-04540</u>
Location:	885 ft FSL & 2000 ft FWL NW SE Sec. 20 - T5S - R3W Duchesne County, Utah.

Pursuant to 40 CFR §144.33, Area UIC Permit No. UT20736-00000 authorizes the permittee to construct and operate, convert, or plug and abandon additional enhanced recovery injection wells within the area permit. This well was determined to satisfy additional well criteria required by the permit.

This well is subject to all provisions of UIC Area Permit No. UT20736-00000, as modified and as specified in the Well Specific Requirements detailed below. This Authorization shall expire one year after the Effective Date unless the permittee has converted the well to injection or submits a written request to extend this Authorization prior to the expiration date.

This Authorization is effective upon signature.

Date: JAN 13 2006


for **Stephen S. Tuber**
*Assistant Regional Administrator
Office of Partnerships and Regulatory Assistance

** The person holding this title is referred to as the Director throughout the Permit and Authorization*





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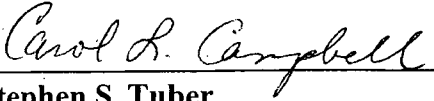
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This Authorization is effective upon signature.

Date: JAN 11 2006


Stephen S. Tuber
*Assistant Regional Administrator
Office of Partnerships and Regulatory Assistance

** The person holding this title is referred to as the Director throughout the Permit and Authorization*



WELL-SPECIFIC REQUIREMENTS

Well Name: Ute Tribal 20-14
EPA Well ID Number: UT20736-04540

Prior to commencing injection operations, the permittee shall submit the following information and receive written Authority to Inject from the Director:

1. a successful Part I (Internal) Mechanical Integrity test (MIT);
2. pore pressure calculation of the proposed injection zone; and
3. completed Well Rework Record EPA Form No. 7520-12 and schematic diagram.

Approved Injection Zone: Injection is approved between the base of the Green River A Lime Marker at 3999 ft to the top of the Basal Carbonate at 6006 ft.

Maximum Allowable Injection Pressure (MAIP): The initial MAIP is **1545 psig**, based on the following calculation:

$$\begin{aligned}\text{MAIP} &= [\text{FG} - (0.433)(\text{SG})] * \text{D}, \text{ where} \\ \text{FG} &= 0.80 \text{ psi/ft} \quad \text{SG} = 1.002 \quad \text{D} = \underline{4226 \text{ ft}} \text{ (top perforation depth KB)} \\ \text{MAIP} &= \underline{1545 \text{ psi}}\end{aligned}$$

UIC Area Permit No. UT20736-00000 also provides the opportunity for the permittee to request a change of the MAIP based upon results of a step rate test that demonstrates the formation breakdown pressure will not be exceeded.

Well Construction and Corrective Action: ***No Corrective Action is required.*** Based on review of well construction and cementing Records, including a CBL, well construction is considered adequate to prevent fluid movement out of the injection zone and into USDWs.

Tubing and Packer: 2-3/8" or similar size injection tubing is approved; the packer shall be set at a depth no more than 100 ft above the top perforation.

Corrective Action for Wells in Area of Review: ***No Corrective Action is required.*** The following well or wells that penetrate the confining zone are within or proximate to a 1/4 mile radius around the Ute Tribal No. 20-14 were evaluated to determine if any corrective action is necessary to prevent fluid movement into USDWs:

Well: Ute Tribal No. 20-13 ← UT20736-04494 Location: SW SW Sec 20 - T5S - R3W

Demonstration of Mechanical Integrity: A successful demonstration of Part I (Internal) Mechanical Integrity using a standard Casing-Tubing pressure test is required prior to injection and at least once every five years thereafter. EPA reviewed the cementing records and determined the cement will provide an effective barrier to significant upward movement of fluids through vertical channels adjacent to the well bore pursuant to 40 CFR 146.8 (a)(2). Therefore, further demonstration of Part II (External) Mechanical Integrity is not required at this time.

Demonstration of Financial Responsibility: The applicant has demonstrated financial responsibility in the amount of \$15,000 via a Surety Bond that has been reviewed and approved by the EPA.

Plugging and Abandonment: The well shall be plugged in a manner that isolates the injection zone and prevents movement of fluids into or between USDWs. Tubing, packers, and any downhole apparatus shall be removed. Class A, C, G, and H cements, with additives such as accelerators and retarders that control or enhance cement properties, may be used for plugs; however, volume extending additives and gel cements are not approved for plug use. Plug placement shall be verified by tagging. Plugging gel of at least 9.2 lb/gal shall be placed between all plugs. A minimum 50 ft surface plug shall be set inside and outside of the surface casing to seal pathways for fluid migration into the subsurface. Within sixty (60) days after plugging the owner or operator shall submit Plugging Record (EPA Form 7520-13) to the Director. The Plugging Record must be certified as accurate and complete by the person responsible for the plugging operation. At a minimum the following plugs shall be emplaced:

- PLUG NO. 1: Set a cast iron bridge plug (CIBP) no more than 50 ft above the top perforation at 4226 ft with a minimum 20 ft cement plug on top of the CIBP.
- PLUG NO. 2: Set a minimum 250 ft cement plug inside of the 5-1/2" casing across the Trona Zone and the Mahogany Shale, in the interval between at least approximately 2750 ft to 3000 ft.
- PLUG NO. 3: Set a minimum 50 ft cement plug on the backside of the 5-1/2" casing, across the surface casing shoe at 269 ft.
- PLUG NO. 4: Set a cement plug inside of the 5-1/2" casing, from at least 250 ft to 300 ft.
- PLUG NO. 5: Set a cement plug, on the backside of the 5-1/2" casing, from surface to a depth of at least 50 ft.
- PLUG NO. 6: Set a cement plug inside of the 5-1/2" casing from surface to a depth of at least 50 ft.

Cut off surface and 5-1/2" casing at least 4 ft below ground level and set P&A marker; submit Sundry Notices and all necessary data as required by the EPA and other regulatory agencies.

WELL-SPECIFIC CONSIDERATIONS

Well Name: Ute Tribal 20-14
EPA Well ID Number: UT20736-00000

Underground Sources of Drinking Water (USDWs): USDWs in the Antelope Creek

Waterflood area generally may occur within the Uinta Formation, which extends from the surface to the top of the Green River Formation at approximately 1674 ft. According to "*Base of Moderately Saline Ground Water in the Uinta Basin, Utah, State of Utah Technical Publication No. 92,*" the base of moderately saline ground water is found at approximately 470 ft below ground surface at this well location. The top of casing cement in this well is at 2645 ft below ground surface (CBL).

Confining Zone: The Confining Zone at this location is approximately 201 ft of interbedded limestone and shale between the depths of 3798 ft to 3999 ft (KB) which directly overlies the Injection Zone, based on correlation to the Antelope Creek Ute Tribal 04-03 well Type Log. Additional impermeable lacustrine shale beds above the Confining Zone provide for further protection for any overlying USDW.

Injection Zone: The Injection Zone at this well location is an approximately 2007 ft section of multiple lenticular sand units interbedded with shale, marlstone and limestone from the base of the Confining Zone at 3999 ft (KB) to the top of the Basal Carbonate Formation at 6006 ft (KB), based on correlation to the Antelope Creek Ute Tribal 04-03 well Type Log.

Well Construction: The CBL shows 80% or greater bond from approximately 3964 ft to 3961 ft, from 3988 ft to 4076 ft, and 4199 ft and deeper, which is considered adequate to prevent migration of fluid out of the injection zone.

Surface casing: 8-5/8" casing is set at 269 ft in a 12-1/4" hole, using 165 sacks cement circulated to the surface.

Longstring casing: 5-1/2" casing is set at 6157 ft (KB) in a 7-7/8" 6157 ft Total Depth hole with a plugged back total depth (PBSD) of 5088 ft, cemented with 465 sacks cement. Top of Cement (TOC): 2645 ft (KB) CBL.

Perforations: top perforation: **4226 ft** Bottom perforation: **5047 ft**

Wells in Area of Review (AOR): Construction and cementing records, including cement bond logs (CBL) as available, for the following well or wells in the 1/4 mile AOR that penetrate the confining zone, were reviewed. Well construction was found adequate to prevent fluid movement out of the injection zone and into USDWs.

Well: Ute Tribal No. 20-13 ← UT20736-04494 TOC: 2490 ft (CBL)